Software Specifications

System Status Viewer

Thor DP3

Doc. # 84K00540-100

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Version 1.0

1. System Status Viewer

1.1 System Status Viewer Introduction

1.1.1 System Status Viewer Overview

The System Status Viewer provides the Checkout and Launch Control System (CLCS) with a viewer that displays the overall status of the Test Set and the detailed status of any subsystem in the Test Set.

As shown in Figure 1, Subsystem Integrity (SSI) running in each of the subsystems monitors the system health, status, and activity within the local subsystem and introduces this data into the data stream as a set of System Status FDs. These System Status FDs are then processed by Data Distribution as would any other FD. The System Status Viewer receives this status data via User Displays Services and provides a Command and Control Workstation (CCWS) display that shows system status of each subsystem and the overall system status of the Test Set.

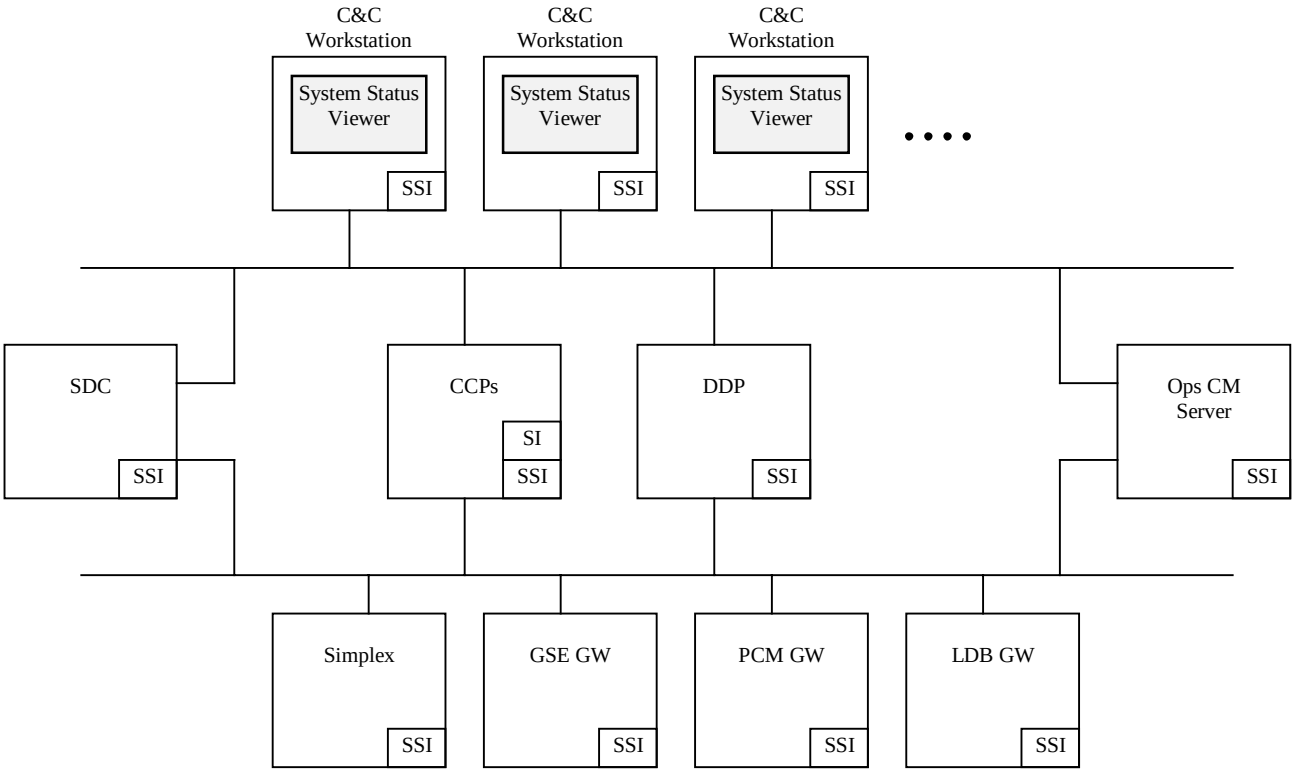


Figure 1 - System Overview

1.1.2 System Status Viewer Operational Description

The System Status Viewer is invoked from the Control Navigation System (CNS) and initially produces a pop-up window displaying a summary of the status of all subsystems. Indicators on this summary level display reflect the overall status of each subsystem. Selecting any of these subsystems with the mouse will produce an additional pop-up window showing more detailed information collected by Subsystem Integrity for that subsystem.

1.2 System Status Viewer Specifications

1.2.1 System Status Groundrules

The following groundrules apply to the System Status Viewer:

- An API will be provided by User Display Services to read Status FDs from the CVT and read status data from the SCT.
- An API will be provided by System Integrity to ~~and~~ read ~~/~~write status ~~data~~information from/to the SCT.
- In order to run in the BASIS environment the On-Line Data Bank and the System Configuration Table must be available. The BASIS environment will provide monitor only capability.
- For Thor, subsystem status will be available for the following subsystems:
  - GSE Gateway
  - PCM D/L Gateway
  - LDB Gateway
  - Consolidated Systems Gateway
  - CCP
  - DDP
  - CCWS

1.2.2 System Status Functional Requirements

The Functional Requirements for the System Status Viewer are arranged as followed:

1.2.2.1 Derived Requirements
1.2.2.2 Subsystem Display Requirements
1.2.2.3 GSE Gateway Display Requirements
1.2.2.4 PCM Downlink Gateway Display Requirements
1.2.2.5 LDB Gateway Display Requirements
1.2.2.6 Consolidated Systems Gateway Display Requirements
1.2.2.7 Data Distribution Processor Display Requirements
1.2.2.8 Command and Control Processor Display Requirements
1.2.2.9 Command and Control Workstation Display Requirements

1.2.2.1 Derived Requirements

1. The System Status Viewer will provide a system status CCWS display that shows the overall system~~Test Set~~ status.
2. The System Status Viewer will provide a summary level display which will show status of all subsystems in a Test Set on a single page.
3. The System Status Viewer will provide a system status display for each subsystem that shows the detailed status of the subsystem (Refer to sections 1.2.2.2 - 1.2.2.9).
4. The System Status Viewer will provide a display for assigning subsystems to a resources.
5. The System Status Viewer will baseline system messages using the System Message Catalog. These messages will contain message and help text.
6. *The System Status Viewer will provide a hardware monitor display depicting the health and status of all hardware resources within a Test Set and within all Test Sets of a Configurable Set.*
   - *The System Status Viewer will display error conditions and indicate error conditions that have not been acknowledged by the controlling operator in yellow.*

- *The System Status Viewer will allow the controlling operator to acknowledge error conditions.*
- *The System Status Viewer will provide the ability to acknowledge all error conditions.*
- *The System Status Viewer will remember the last error acknowledgments.*
- *The System Status Viewer will display the time at which the last error occurred on each subsystem.*

7. The System Status Viewer will conform to the "CLCS HCI Style Guide and Standards" document number 84K00230.
8. *The System Status Viewer will also execute in the BASIS environment.*

1.2.2.2 Subsystem Display Requirements

The following is a list of status information that will be displayed by the System Status Viewer for each subsystem. See Appendix A for definitions of each item.

1. Subsystem Name
2. TCID
3. Test Set
4. Location
5. Reference Designator
6. Host Name
7. Attached To
8. Current State
   a) Communicating
   b) Go
   c) In Configuration
   d) Loaded
   e) Logical Port
   f) ORT Running
   g) Switchover Active/Inhibited

9. Health Counter
10. *Recovery Code*
11. Processes (DDPs, CCPs, and CCWS only)
12. *Available Memory*
13. *Available Disk Space*
14. Disk Use Counter
15. Disk Error Counter
16. High Packets TX
17. Time of High Packets TX
18. High Bytes TX
19. Time of High Bytes TX
20. High Packets RX
21. Time of High Packets RX
22. High Bytes RX
23. Time of High Bytes RX
24. High Bytes TX and RX
25. Time of High Bytes TX and RX
26. Packet Error Counter
27. *Serial Number*
28. *SCID*
29. *IP Address*
~~30.Time of Last Error.~~

1.2.2.3 GSE Gateway Display Requirements

In addition to the information listed in section 1.2.2.2, the System Status Viewer will display the following status information for GSE Gateways.

1. *Interface Started*
2. Global Measurement ~~Data Valid~~Processing (Active/Inhibited)
3. Global Commands (Active/Inhibited)~~Enabled~~
4. Global Change Processing (Active/Inhibited)~~Enabled~~
5. Global HIM Testing Enabled
6. HIM *N* Polling Active/Inhibited
7. HIM *N* Test Active/Inhibited
8. *Results of Last HIM Test (Success/Fail)*
9. Other GSE details as specified by developers.

1.2.2.4 PCM Downlink Gateway Display Requirements

In addition to the information listed in section 1.2.2.2, the System Status Viewer will display the following status information for PCM Gateways.

1. *Interface Started*
2. Global Measurement ~~Data Valid~~Processing (Active/Inhibited)
3. Global Significant Change Processing (Active/Inhibited)~~Enabled~~
4. Other PCM details as specified by developers.

1.2.2.5 LDB Gateway Display Requirements

In addition to the information listed in section 1.2.2.2, the System Status Viewer will display the following status information for LDB Gateways.

1. *Interface Started*
2. Global Commands (Active/Inhibited)~~Enabled~~
3. Successful Uplink Count
4. Successful Downlink Count
5. TX Cycle Error Count
6. RX Cycle Error Count~~Bus Error Counts~~
7. Bus Switch Counts
8. Other LDB details as specified by developers.

1.2.2.6 Consolidated Systems Gateway Display Requirements

In addition to the information listed in section 1.2.2.2, the System Status Viewer will display the following status information for Consolidated Gateways.

Other Consolidated Gateway details as specified by developers.

1.2.2.7 Data Distribution Processor Display Requirements (DDP)

In addition to the information listed in section 1.2.2.2, the System Status Viewer will display the following status information for Data Distribution Processors.

Other DDP specific details as specified by developers.

1.2.2.8 Command and Control Processor Display Requirements (CCP)

In addition to the information listed in section 1.2.2.2, the System Status Viewer will display the following status information for Command and Control Processors.

Other CCP specific details as specified by developers.

1.2.2.9 Command and Control Workstation Display Requirements (CCWS)

In addition to the information listed in section 1.2.2.2, the System Status Viewer will display the following status information for Command and Control Workstations.

Other CCWS specific details as specified by developers.

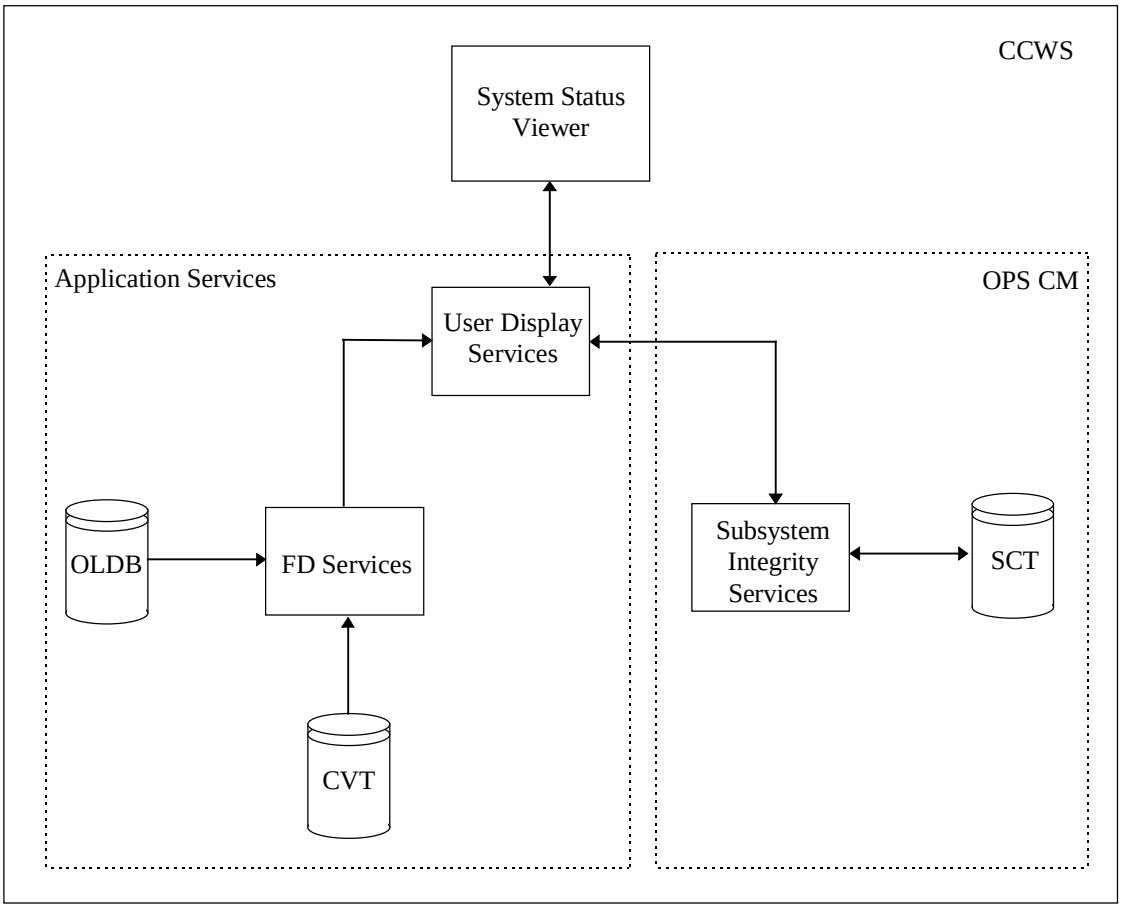
1.2.3 System Status Performance Requirements

The following performance requirements apply to the System Status Viewer:

1. The System Status Viewer will appear on the CCWS screen within three seconds of selection from the display task bar.
2. The System Status Viewer will be refreshed ~~at~~ once every 500 milliseconds~~per second~~.

1.2.4 System Status Viewer Interfaces Data Flow Diagrams

The System Status Viewer will receive all status information from the Current Value Table and the System Configuration Table via User Display ~~Application~~ Services, as shown below in Figure 2.



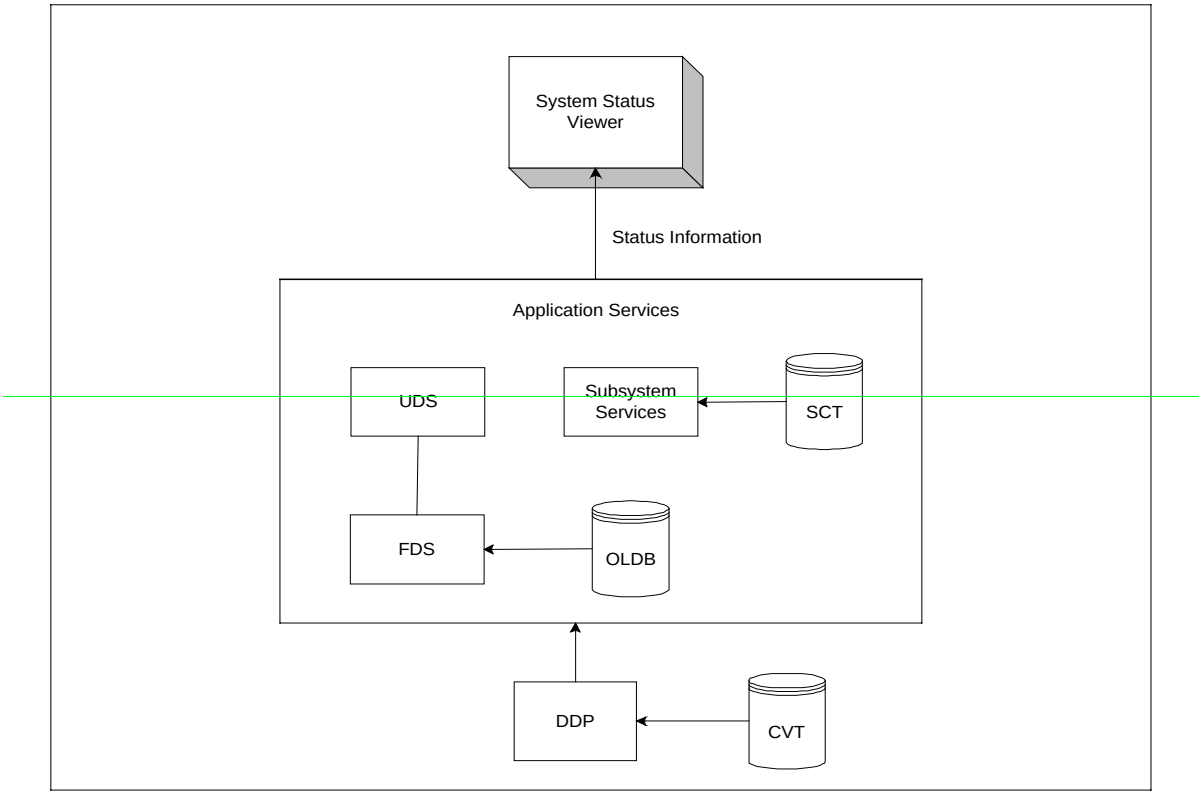


Figure 2 - Interface Data Flow Diagram

1.3 System Status Viewer Design Specification

The System Status Viewer runs in the CCWS and is invoked from the Control Navigation System (CNS). It is implemented in Java.

1.3.1 System Status Viewer Detailed Data Flow

The following is the Detailed Data Flow diagram of the System Status Viewer. User selections are received by the main Status Viewer Class. The Status Viewer Class then requests data from the appropriate subsystems. The subsystem class will retrieve SCT data from Subsystem Integrity via User Display Services. The subsystem class will also handle the retrieval of FD data from FD Services via the FD Class and User Display Services. The updated subsystem data is finally displayed back to the user by the main Status Viewer Class.

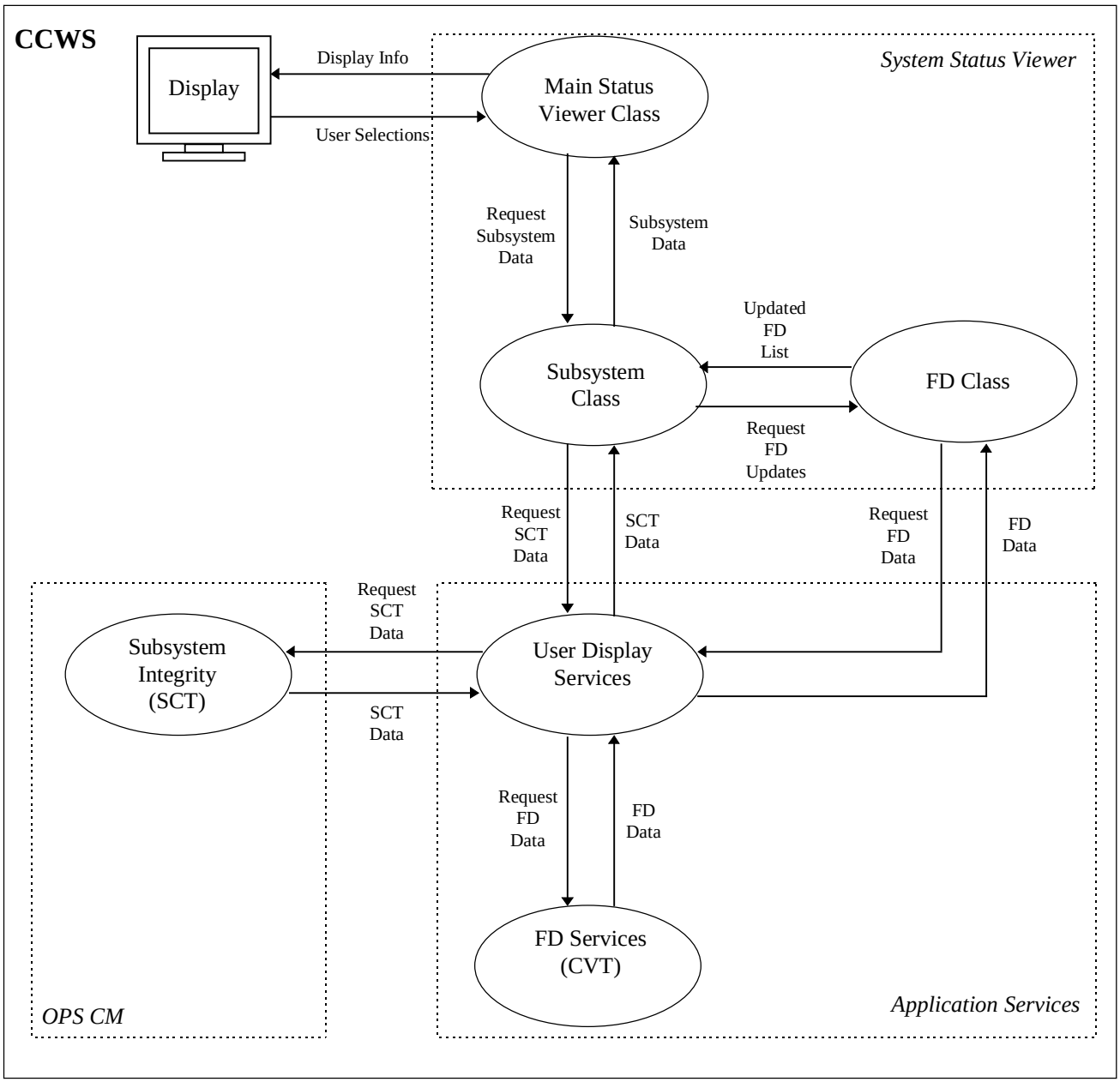


Figure 3 : Detailed Data Flow Diagram

1.3.2 System Status Viewer External Interfaces

1.3.2.1 System Status Viewer Message Formats

Messages will be created to indicate the following conditions:

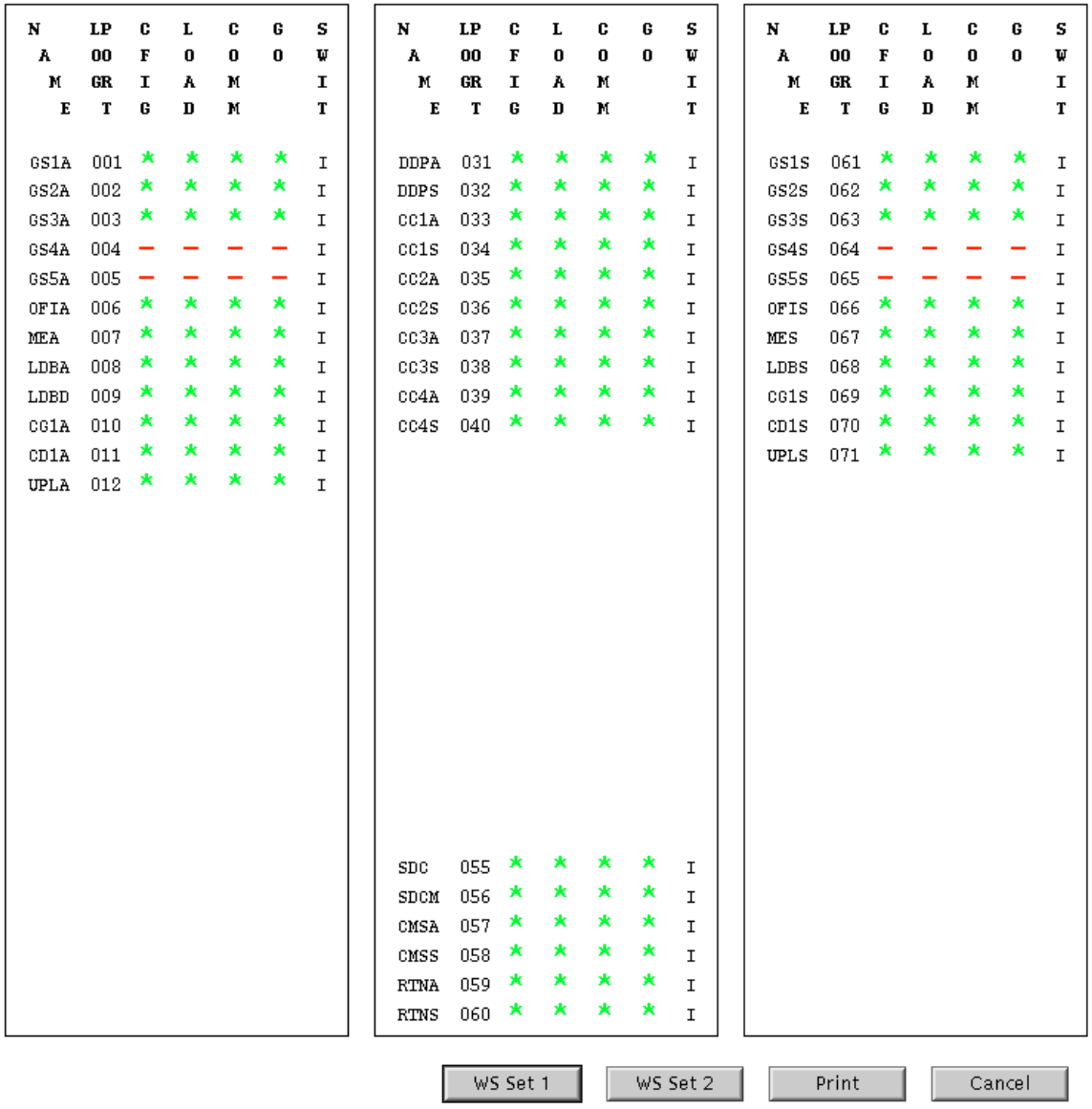
- FD information from CVT is unavailable.
- Status information from SCT is unavailable.
- Unable to write to SCT.

1.3.2.2 System Status Viewer Display Formats

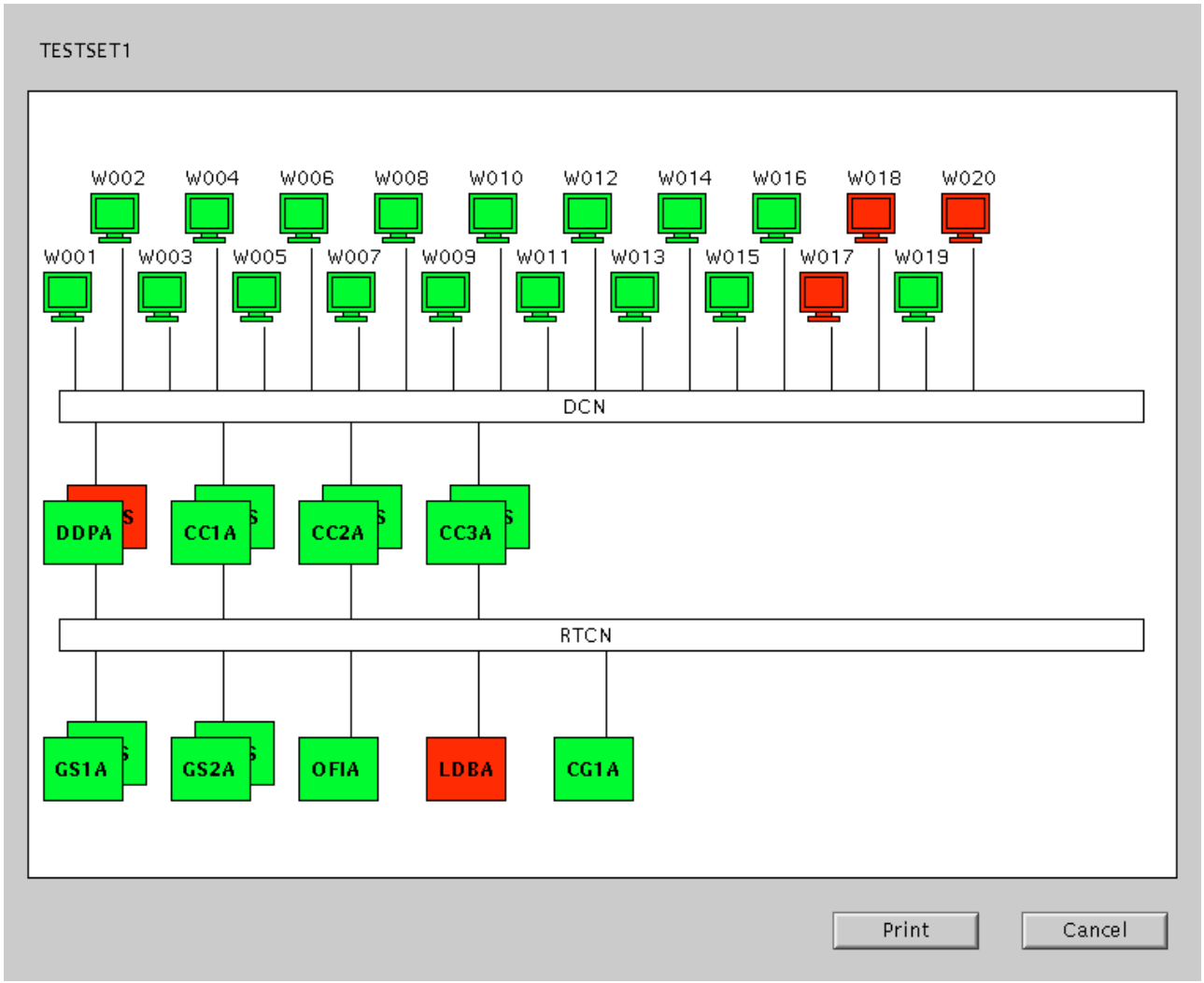
The System Status Viewer will contain three types of summary displays: A text version, a logical (network) version, and a physical version (post-Thor). Each of these summary displays provide an overview of the status of all subsystems in a test set. By selecting any of the subsystems on a summary display, a user can view a more detailed status display for that subsystem.

The System Status Viewer displays are shown on the following pages.

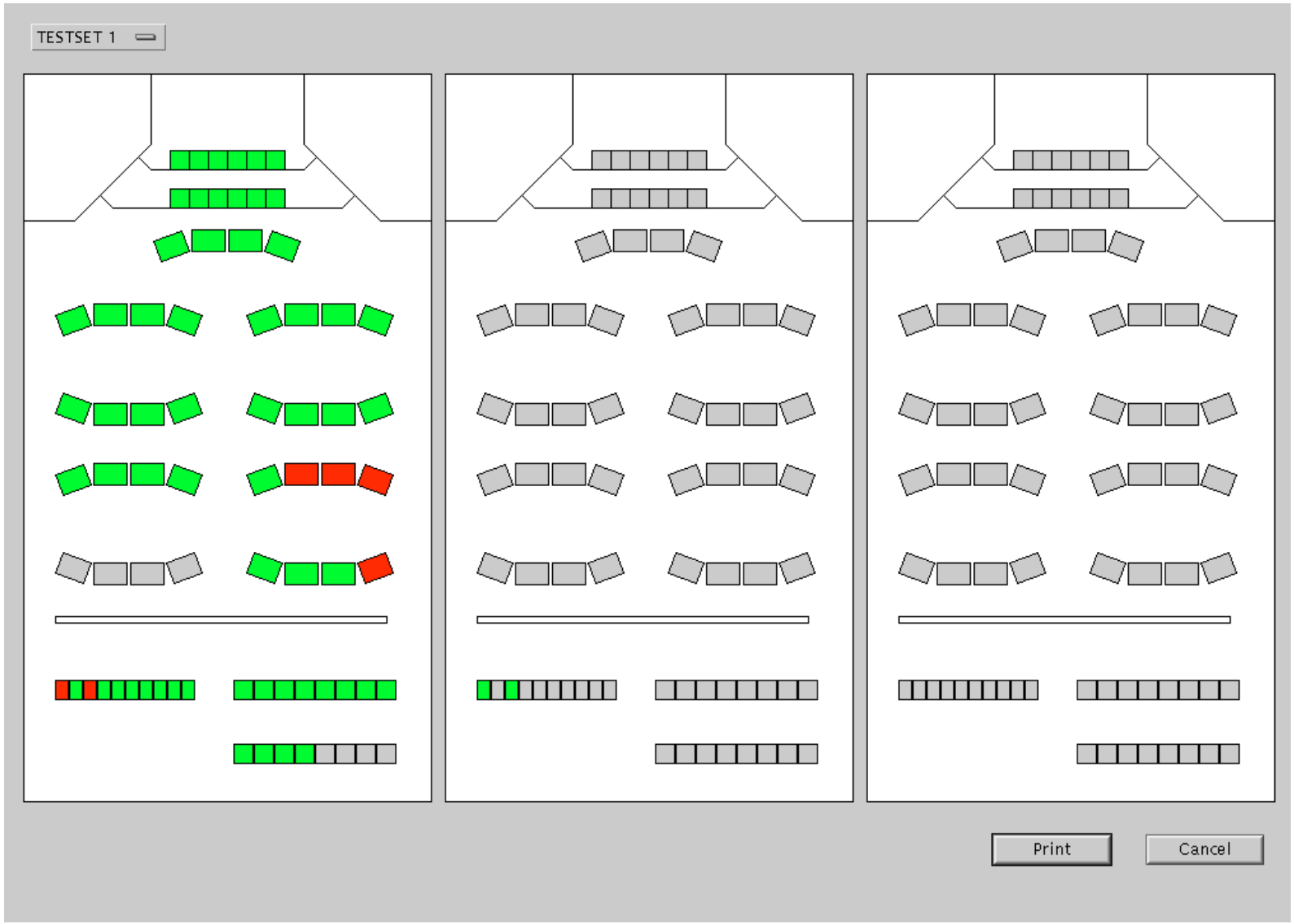
A. System Status Viewer Text Display



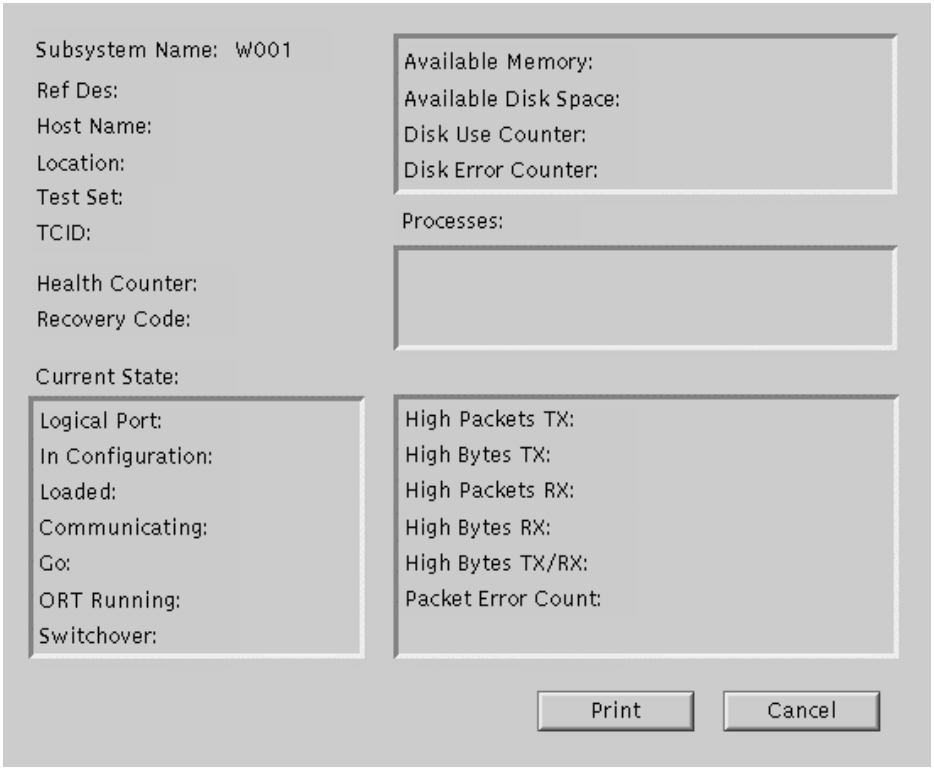
B. System Status Viewer Logical Display



C. System Status Viewer Physical Display *(Post Thor)*



D. System Status Viewer Detailed Subsystem Display (Will be slightly different for each subsystem type).



1.3.2.3 System Status Viewer Input Formats

The System Status Viewer receives two types of inputs from User Display Services. For receiving SCT data, the System Status Viewer will pass the subsystem name and User Display Services will return a structure containing the SCT data for that subsystem. For receiving FD data, the System Status Viewer will pass the FD Name and User Displays Services will return a structure containing the FD data for that FD.

1.3.2.4 Recorded Data

Not Applicable.

1.3.2.5 System Status Viewer Printer Formats

When the Print button on one of the System Status Viewer windows is pressed, a snapshot of that window will be printed.

1.3.2.6 Interprocess Communications

See section 1.3.1.

1.3.2.7 System Status Viewer External Interface Calls

The System Status Viewer receives status information from the CVT and the SCT via User Display Services. Refer to the User Display Services Interface Description Document. (Document Number: 84K00361).

1.3.2.8 System Status Viewer Table Formats

Not Applicable.

1.3.3 System Status Viewer Test Plan

The System Status Viewer system level tests will be run in either the IDE or SDE. The System Status Viewer will be run on a CCWS and monitor status of Gateways, DDPs, CCPs, and other CCWSs. The specific test cases that will be run include:

1. Verify on the System Status Viewer summary display that it is monitoring the subsystems in Test Set.
2. Change the states of subsystems in the set and verify that the configuration changes are displayed by the System Status Viewer.
3. Fail subsystems in the set and verify that the failures are displayed by the System Status Viewer.
4. Verify that the selection of a subsystem on the System Status Viewer summary page produces a pop-up window that shows more status details of that subsystem.
5. Verify that the print button produces a hardcopy of the display on which the button was pressed.

Appendix A

Definitions:

Status Information	Description
Available Disk Space	Disk space available on the machine.
Available Memory	Memory available on the machine.
Attached To	BUS IDs, PCM Streams, …
Current State	
a) Communicating	Indication of whether subsystem is communicating. T/F
b) Go	Indication of whether subsystem is in Go Mode. T/F
c) In Configuration	Indication of whether subsystem is in configuration. T/F
d) Loaded	Indication of whether cpu is loaded. T/F
e) Logical Port	The Logical Port of the subsystem.
f) ORT Running	Indication of whether subsystem is operational. T/F
g) Switchover	Indication of the switchover status. (Active/Inhibited)
Disk Error Counter	Count of disk errors.
Disk Use Counter	Count of disk use.
Health Counter	Subsystem Heath Counter (incremented if subsystem is properly performing its function).
High Bytes RX	Highest number of bytes received in one second.
High Bytes TX	Highest number of bytes transmitted in one second.
High Bytes TX and RX	Highest number of bytes transmitted and received in one second.
High Packets RX	Highest number of packets received in one second.
High Packets TX	Highest number of packets transmitted in one second.
Host Name	The UNIX Host Name of the machine.
Location	LCC, HMF, CITE, SAIL, Dryden, SDE 1, SDE 2, IDE 1, IDE 2.
Packet Error Counter	Count of packet errors.
Processes	Names of processes running on the subsystem. (multiple)
Recovery Code	Subsystem Recovery Code (reason for subsystem failure if available).
Reference Designator	The Reference Designation of the machine.
Subsystem Name	GSE 1-5 {A/S}, SSME {A/S}, OIGPC {A/S}, LDB {A/S}, CCP1-8 {A/S}, DDP 1-2 {A/S}, C&C 1-48, OCM.
Time of High Bytes RX	The Time at which the High Bytes RX occurred.
Time of High Bytes TX	The Time at which the High Bytes TX occurred.
Time of High Bytes TX/RX	The Time at which the High Bytes TX and RX occurred.
Time of High Packets RX	The time at which the High Packets RX occurred.
Time of High Packets TX	The time at which the High Packets TX occurred.

Appendix B

The following matrix contains the status information that will be displayed by the System Status Viewer and the source of the data.

Subsystem	GSE GW	PCM GW	LDB GW	Cons. GW	DDP	CCP	C&C WS
Subsystem Name	SCT	SCT	SCT	SCT	SCT	SCT	SCT
Serial Number	SCT	SCT	SCT	SCT	SCT	SCT	SCT
Host Name	SCT	SCT	SCT	SCT	SCT	SCT	SCT
IP Address	SCT	SCT	SCT	SCT	SCT	SCT	SCT
Reference Designator	SCT	SCT	SCT	SCT	SCT	SCT	SCT
Location	SCT	SCT	SCT	SCT	SCT	SCT	SCT
Test Set	SCT	SCT	SCT	SCT	SCT	SCT	SCT
TCID	SCT	SCT	SCT	SCT	SCT	SCT	SCT
SCID	SCT	SCT	SCT	SCT	SCT	SCT	SCT
Attached To	SCT	SCT	SCT	SCT	SCT	SCT	SCT
Current State:							
Logical Port	SCT	SCT	SCT	SCT	SCT	SCT	SCT
In Configuration	FD	FD	FD	FD	FD	FD	FD
Loaded	FD	FD	FD	FD	FD	FD	FD
Communicating	FD	FD	FD	FD	FD	FD	FD
Go	FD	FD	FD	FD	FD	FD	FD
ORT Running	FD	FD	FD	FD	FD	FD	FD
Switchover	FD	FD	FD	FD	FD	FD	FD
Health Counter	FD	FD	FD	FD	FD	FD	FD
Recovery Code	FD	FD	FD	FD	FD	FD	FD
Available Memory	FD	FD	FD	FD	FD	FD	FD
Available Disk Space	FD	FD	FD	FD	FD	FD	FD
Disk Use Counter	FD	FD	FD	FD	FD	FD	FD
Disk Error Counter	FD	FD	FD	FD	FD	FD	FD
Processes (multiple)	--	--	--	--	FD	FD	FD
High Packets TX in 1 Second	FD	FD	FD	FD	FD	FD	FD
Time of High Packets TX in 1 Second	FD	FD	FD	FD	FD	FD	FD
High Bytes TX in 1 Second	FD	FD	FD	FD	FD	FD	FD
Time of High Bytes TX in 1 Second	FD	FD	FD	FD	FD	FD	FD
High Packets RX in 1 Second	FD	FD	FD	FD	FD	FD	FD
Time of High Packets RX in 1 Second	FD	FD	FD	FD	FD	FD	FD
High Bytes RX in 1 Second	FD	FD	FD	FD	FD	FD	FD
Time of High Bytes RX in 1 Second	FD	FD	FD	FD	FD	FD	FD
High Bytes TX and RX in 1 Second	FD	FD	FD	FD	FD	FD	FD
Time of High Bytes TX and RX in 1 Second	FD	FD	FD	FD	FD	FD	FD
Packet Error Counter	FD	FD	FD	FD	FD	FD	FD
Interface Started	FD	FD	FD	--	--	--	--
Global Measurement Processing	FD	FD	--	--	--	--	--
Global Commands	FD	--	FD	--	--	--	--
Global Change Processing	FD	FD	--	--	--	--	--
Global HIM Testing Enabled	FD	--	--	--	--	--	--
Successful Uplink Count	--	--	FD	--	--	--	--

Successful Downlink Count	--	--	FD	--	--	--	--
TX Cycle Error Count	--	--	FD	--	--	--	--
RX Cycle Count	--	--	FD	--	--	--	--
Bus Switch Counts	--	--	FD	--	--	--	--
HIM Polling Active/Inhibited	FD	--	--	--	--	--	--
HIM Testing Active/Inhibited	FD	--	--	--	--	--	--

Figure 4: System Status Viewer Display Information

Appendix C

Class Diagram

This appendix contains the class diagram for the System Status Viewer. The main Status Viewer Class is responsible for managing data updates to all subsystems in the Test Set at the specified refresh rate. The Status Viewer Class contains a list of subsystem classes. Each subsystem class contains SCT data for that subsystem and a list of status FD classes for that subsystem. The main Status Viewer Class also creates instances of summary and detailed display classes.

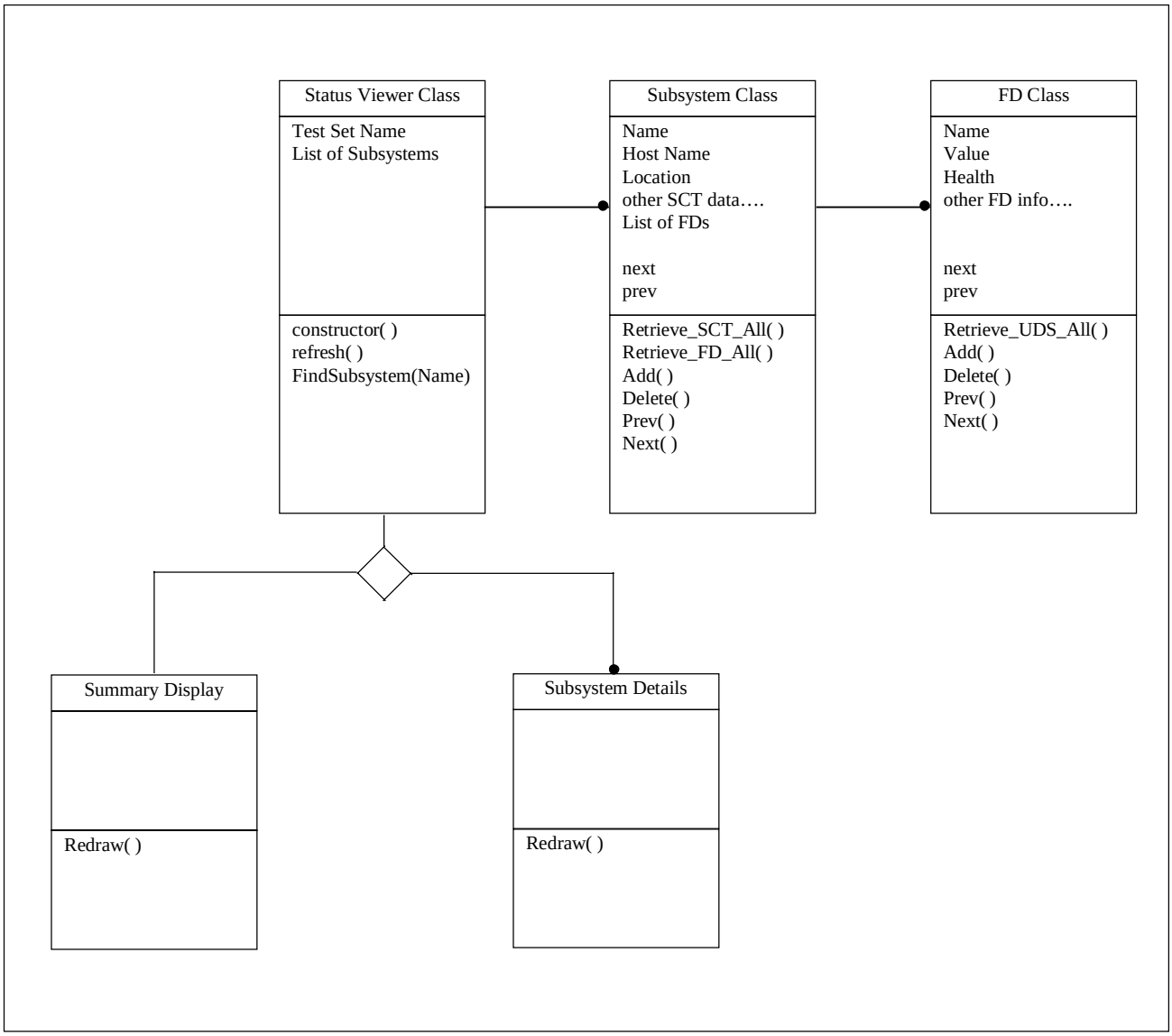


Figure 5 : System Status Viewer Class Diagram

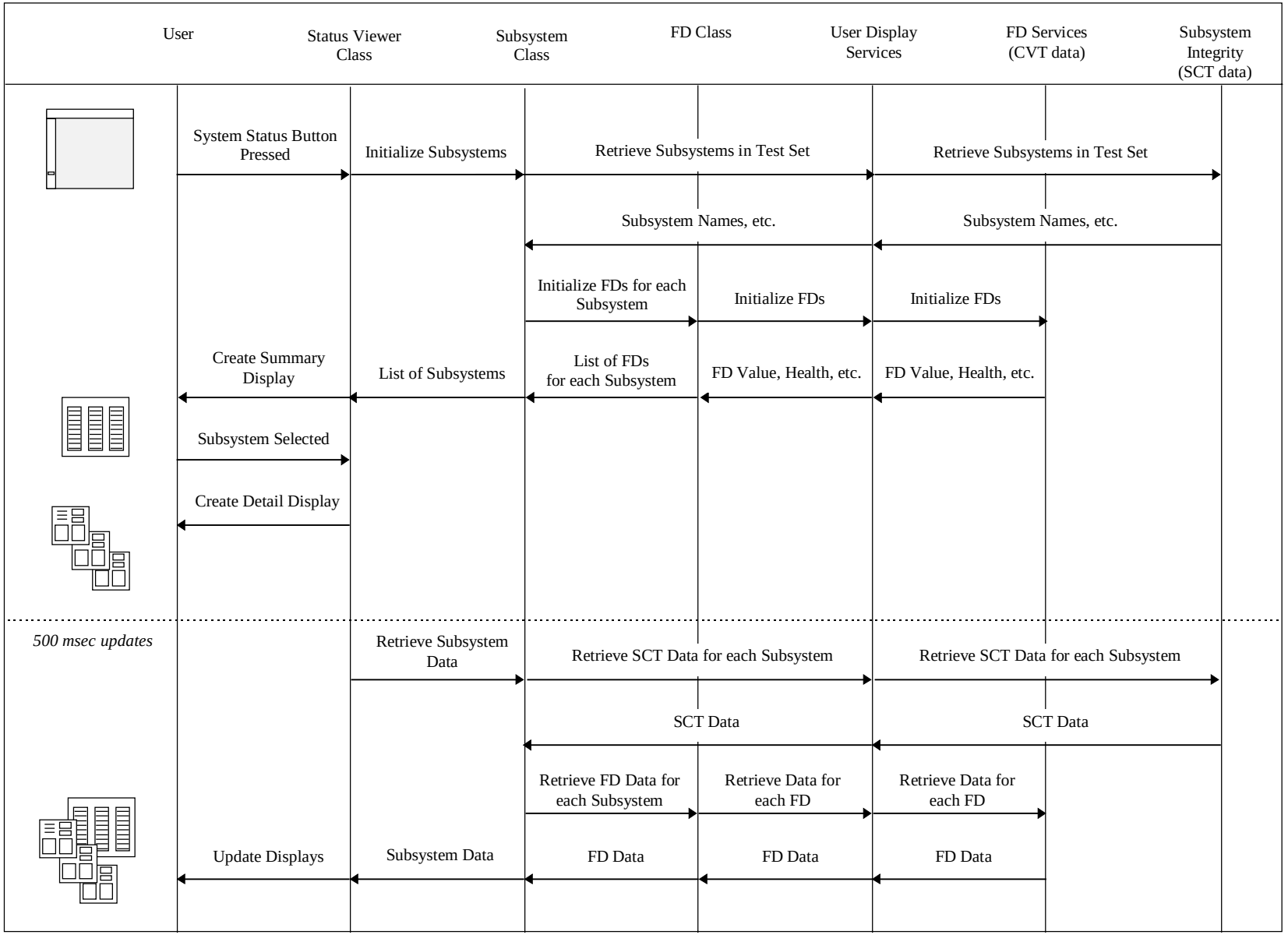


Figure 6: System Status Viewer Event Trace Diagram